

Please substitute the enclosed red-lined drawings for Figures 1 - 3. After approval, new formal drawings will be provided.

IN THE CLAIMS

Please cancel claims 2, 9 and 10, without prejudice.

Please amend the claims, to read as follows:

1. (Amended) A projectile for use with a gun system, comprising:
 - a fuze;
 - a projectile body including an open front end and a closed rear end;
 - wherein the front end of the projectile body is secured to the fuze;
 - a boom assembly secured to the closed end of the projectile body;
 - a center vent tube having a forward end that is secured to the fuze, and a rearward end that abuts against the rear end of the projectile body, to form a smoke chamber and to provide added weight to control a center of gravity of the projectile;
 - wherein the rear end of the projectile body includes at least one normally closed vent hole in communication with the smoke chamber; and
 - at least one vent plug that fits in the vent hole closing it; that is unplugged from the projectile body upon function of the fuze, to allow smoke that accumulates inside the smoke chamber to be released; and that provides an indication of a dud.
3. (Amended) The projectile according to claim 1, wherein the at least one vent hole includes a plurality of vent holes.
5. (Amended) The projectile according to claim 3, further comprising a plurality of vent plugs that fit in the vent holes.

Please add new claims 11-14 to read as follow:

--11. (New) The projectile according to claim 8, wherein the center vent tube is mounted along an axial length of the projectile body.

12. (New) The projectile according to claim 11, wherein the fuze has an elongated stepped shape comprised of a forward end, an intermediate step, and a narrower rearward step.

13. (New) The projectile according to claim 12, wherein the rearward step defines an edge with the intermediate step.

14. (New) The projectile according to claim 13, wherein the center vent tube has a forward edge, such that when the projectile is assembled, the rearward step fits inside the center vent tube, with the forward edge abutting the edge defined between the rearward step and intermediate step, to secure the center vent tube to the fuze.--

REMARKS

Copies of both oaths from the parent application are provided herewith. The Examiner had required a new oath in the parent case. The original oath was filed in February 2002 with the parent case. The second oath was signed in August 2002 on two separate forms, the first was signed by inventor Han, and the second form was signed by the remaining 3 named inventors Mazzei, Cheung, and Noble.

This is a new application. However, in an effort to advance the prosecution, Applicants wish to address rejections raised in the Final Rejection of parent case, serial number 10/087,711 which are as follow:

THE CLAIMS

CLAIMS REJECTIONS UNDER 35 U.S.C. 103

Claim 1 was rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen in

view of Carter. Claims 2-8, and 10-14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen in view of Rottenberg et al. ("Rottenberg"). Applicants respectfully traverse these rejections and submit that the claims on file are not obvious in view of Jensen in view of either Carter or Rottenberg, and are thus patentable thereover. In support of this position, Applicants submit the following arguments.

Claim 1 has now been amended to incorporate the limitations of claim 2.

A. Legal Standard for Obviousness

The following court opinions set the general legal standards in support of Applicants' position of non obviousness, with emphasis added for added clarity:

- **"Obviousness cannot be established** by combining the teachings of the prior art to produce the claimed invention, **absent some teaching or suggestion** supporting the combination." *In re Fine*, 837 F.2d at 1075, 5 USPQ2d at 1598 (citing *ACS Hosp. Sys. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)). **What a reference teaches** and whether it teaches toward or **away from the claimed invention** are questions of fact. See *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 960-61, 220 USPQ 592, 599-600 (Fed. Cir. 1983), cert. denied, 469 U.S. 835, 83 L. Ed. 2d 69, 105 S. Ct. 127 (1984). "
- "When a rejection depends on a combination of prior art references, there must be **some teaching, suggestion, or motivation** to combine the references. See *In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987)."
- "With respect to core factual findings in a determination of patentability, however, the **Board cannot simply reach conclusions based on its own understanding or experience** — or on its assessment of what would be basic knowledge or common sense. **Rather, the Board must point to some concrete evidence in the record** in support of these findings." See *In re Zurko*, 258 F.3d 1379 (Fed. Cir. 2001).
- "We have noted that **evidence of a suggestion, teaching, or motivation to combine** may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, see *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), *Para-Ordinance Mfg. v. SGS Imports Intern., Inc.*, 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995), although "the suggestion more

often comes from the teachings of the pertinent references," *Rouffet*, 149 F.3d at 1355, 47 USPQ2d at 1456. The range of sources available, however, does not diminish the requirement for actual evidence. That is, **the showing must be clear and particular**. See, e.g., *C.R. Bard*, 157 F.3d at 1352, 48 USPQ2d at 1232. **Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence."** E.g., *McElmurry v. Arkansas Power & Light Co.*, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993) ("Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact."); *In re Sichert*, 566 F.2d 1154, 1164, 196 USPQ 209, 217 (CCPA 1977)." See *In re Dembiczak*, 175 F.3d 994 (Fed. Cir. 1999).

- "To prevent the use of hindsight based on the invention to defeat patentability of the invention, **this court requires the examiner to show a motivation to combine the references** that create the case of obviousness. In other words, **the examiner must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references **for combination in the manner claimed**." See *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998)."

- MPEP 2143.01-"The Prior Art Must Suggest The Desirability Of The Claimed Invention. There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (**The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.**). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

- The mere fact that references can be combined or modified does not render the resultant combination obvious **unless the prior art also suggests the desirability of the combination**. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, **there must be a suggestion or motivation in the reference** to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).

B. Application of the Obviousness Standard to the Present Invention

1. Elements Not Disclosed By Jensen

Applicants respectfully submit that the following elements and combination of elements and resulting features recited in claim 1 and the claims dependent thereon, are not disclosed in Jensen. (with emphasis added):

“1. A projectile for use with a gun system, comprising:...

a center vent tube having a forward end that is secured to the fuze, and a rearward end that abuts against the rear end of the projectile body, to form a smoke chamber and to provide added weight to control a center of gravity of the projectile;

wherein the rear end of the projectile body includes at least one normally closed vent hole in communication with the smoke chamber; and

at least one vent plug that fits in the vent hole closing it; that is unplugged from the projectile body upon function of the fuze to allow smoke that accumulates inside the smoke chamber to be released; and that provides an indication of a dud.” Emphasis added.

2. Jensen does not show a center vent tube that provides the claimed functionalities

As ground for the obviousness rejection of claim 1, the office action states that "Claim 1, is rejected under 35 U.S.C. 103(a) as being unpatentable Over U.S. Patent No. 4,549,487 to Jensen in view of U.S. Patent No. 4,109,579 to Carter. Referring to claim 1, Jensen discloses a projectile for use with a gun system comprising, a fuse - 14, a projectile body - 12 including an open front end and a closed rear end, wherein the front end of the projectile body is secured to the fuse - 14, a boom assembly - 16 and 20 secured to the closed end of the projectile body - 12, **a center vent tube - 11 having a forward end that is secured to the fuse - 14 and seal, and a rearward end that abuts against the rear end of the projectile body - 12 and seal, to form a smoke chamber**, and wherein the rear end of the projectile body - 12 includes **at least one vent hole - 15** in communication with the smoke chamber - see for example figures 1-3. **Jensen does not disclose the center vent tube is to provide added weight to control a center of gravity of the projectile.** Carter does disclose the center vent tube - 14 is to provide added weight to control a center of gravity of the projectile - **see for example columns 1-3** which states **the projectile is to simulate the weight and location of the center of gravity of a tactical shell.** Therefore the center of gravity of the projectile, is to be controlled and **it is inherent that the center vent tube has weight,** which is located inside the projectile as seen in figure 1, which is used to determine and control the center of gravity of the projectile. Therefore **it would have been obvious to one ordinary skill in the art to take the projectile of Jensen and add the center vent tube used to control the center of gravity of Carter, so as to make the device have the properties of a real projectile,** so as to give the persons that are training with the projectile a real representation of how to use the projectile and how the projectile acts so they can be prepared to use real live projectiles." Emphasis added.

The office action further added: "In regards to claim 1, applicant states item - 1. 1 of the Jensen reference is not a tube but just a passageway and thus cannot be secured to the fuse and also the rear end of the projectile. **As seen in Merriam-W bster's**

Collegiate Dictionary 10th edition, (the word tube is synonymous with the word tunnel and the word tunnel is defined as a covered passageway. As seen in figures 1-3 of Jensen, the passageway - 11 is covered by the inner wall of the projectile body at - 12 and therefore item - 11 of Jensen is a tube and therefore as seen in figures 1 -3 the forward end of item - 11 is secured to the fuse at the threads proximate, items 13 and 33 in figures 1-2. Further as seen in figures 1-3 item - 11 abuts or is in communication and/or contact with the rear end of the projectile for example proximate item 15 in figure 1.

Further applicant states the newly added claim limitations overcome the lack of novelty rejection -under 35 U.S.C. 102(b) and this is correct, however as seen above in paragraph 4 of this office action the Carter reference teaches the newly added claim limitations and in combination with the Jensen reference renders the claim obvious as stated above." Emphasis added.

Applicants respectfully traverse this rejection ground on the basis that the **"passage 11" of Jensen cannot be equated to the center vent tube 4 of the present invention.** Though one of the meanings of "tube" could be "tunnel," this does not necessitate that the term tube could be used interchangeably with tunnel. In support of this position, Applicants submit that the cited dictionary is not a technical dictionary, and thus the meanings provided are literal meanings. As an example, the term "tunnel" actually means a tunnel, such as a passageway through a mountain. This term is definitely from a non-analogous art and cannot be substituted for a tube. In addition, to Applicants' best understanding, the term "tube" as used by the Examiner, is a British term that refers to a train or underground system, and is thus unusable in the context of the present invention.

Furthermore, other meanings for tube include a hose, and a television set, but it should be quite clear that the term hose and television sets cannot be used herein, just as the term tunnel cannot be used herein. Applicants respectfully submit that the term tube should be given its simple and proper meaning herein, as a hollow structure with a

mass. To conclude, a dictionary meaning does not automatically provide a suitable substitute for a word, particularly if the substitute word is not directly correlated to the invention.

As clearly stated in the specification, the center vent tube 4 provides dual functionality, one of which is a passageway, but the other very important functionality is that it acts as a counterweight, as is described in the excerpts from the specifications below, with emphasis added:

“The physical properties of the projectile 100 can simulate those of the M720 HE mortar cartridge by adding the center vent tube 4. The center vent tube 4 provides the same or similar center of gravity location of the projectile 100 as that of the M720 HE mortar cartridge. The center vent tube 4 provides the same or similar weight for the projectile 100 as for the M720 HE mortar cartridge filled with explosives. The center vent tube 4 further provides the same or similar axial and transversal moments of inertia to the projectile 100 as those for the M720 HE mortar cartridge.”

“The center vent tube 4 is hollow and is generally cylindrically shaped. It is mounted centrally, along the axial length of the projectile body 1, coincident with the central axis X-X of the projectile 100. The thickness of the vent tube can be various depending on the effort of locating the CG position of the projectile 100. The center vent tube 4 is mounted inside of the projectile body 1. The forward end of the center vent tube 4 is secured to the fuse rear chamber 103, which is normally need for explosives with smoke generating substances. The rear end of the center vent tube 4 is positioned at the rear end of the body 1 without blocking the vent holes 5 and any part of the vent plugs 6. Any mating sections between the center vent tube 4 and the body 1 and the fuze 2 should be properly sealed to be gap-free to prevent gas leaks during launching.”

“The center vent tube 4 provides dual functionality, which dual functionality is not provided by the passageway of Jensen. The center vent tube 4 acts as a balance

weight to counter the removal of explosives to simulate the physical property of a tactical round. In this respect, the center vent tube 4 ensures the physical properties of the projectile 100 to remain generally unchanged from the tactical round. The other function of the center vent tube 4 is to act as a passage (duct) for smoke, which is generated upon fuze function, to reach the vent holes 5.”

In addition, the **passage 11 of Jensen is not and cannot be secured** to the fuze since it is a hollow chamber. Furthermore, and for the same reason, the rearward end of the passageway 11 **cannot be said to abut against** the rear end of the projectile body, to form a smoke chamber.

3. Carter does not disclose a center vent tube that provides added weight to control the center of gravity of the projectile

To reiterate part of the rejection ground for ease of reference, the office action states that “Carter does disclose the center vent tube - 14 is to provide added weight to control a center of gravity of the projectile - see for example columns 1-3 which states the projectile is to simulate the weight and location of the center of gravity of a tactical shell.”

Applicants submit that this rejection lacked specificity in that it literally cites the entire specification without the claims and the abstract. Applicants request that either this rejection be withdrawn or be corrected in a subsequent office action.

Applicants further traverse this rejection ground and submit that Carter discloses that the ballast material (but not the tube), is used to control the center of gravity of the shell, see for example, column 1, lines 53-55; and column 3, lines 3-5. The question is, if Carter uses the tube to control the center of gravity, why then would Carter use the ballast? In this respect, Carter teaches away from the present invention, as claimed.

4. The combination of Jensen and Carter is improper

In support of the combination of Jensen and Carter, the office action states:
“Therefore it would have been obvious to one ordinary skill in the art to take the projectile of Jensen and add the center vent tube used to control the center of gravity of Carter, so as to make the device have the properties of a real projectile, so as to give the persons that are training with the projectile a real representation of how to use the projectile and how the projectile acts so they can be prepared to use real live projectiles.”

Applicants also traverse this rejection ground, and state that Jensen and Carter cannot be properly combined, as submitted by the Examiner, in that neither reference discloses a motivation for such combination. As clearly explained by the legal authorities above, the **court requires that the examiner show a motivation to combine the references** that create the case of obviousness. In other words, **the examiner must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references **for combination in the manner claimed.**”

Applicants submit that the office action does not provide such justifiable reasons. A wish or a desire to have a training projectile simulate a live projectile, without more reasoning, is insufficient to satisfy the legal requirements for an obviousness rejection.

5. Jensen does not disclose normally closed egress vent holes.

The office action stated that “Claims 2-8 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen as modified by Carter as applied to claim 1 above, and further in view of U.S. Patent No. 4,397,240 to Rottenberg et al.

Referring to claim 2, Jensen as modified by Carter further discloses at least one vent plug - 17 fits in the vent hole - 15 before impact with a target to allow smoke that

accumulate inside the smoke chamber to be released - see for example figures 1-3 and columns 4-5 of Jensen. Jensen as modified by Carter does not disclose the vent plug is unplugged from the projectile body upon function of the fuse. Rottenberg et al. does disclose the vent plug - 49 is unplugged from the projectile body - 41 upon function of the fuse - 23 and 39 - see for example figures 2-3 and columns 2-4. Therefore it would have been obvious to one of ordinary skill in the art to take the projectile with vent plugs of Jensen as modified by Carter and add the vent plugs being unplugged upon use of the fuse of Rottenberg et al., so as to allow for the proper venting of the gases within the projectile so that the pressure inside the projectile does not get too high thereby causing the projectile to explode and cause possible injuries."

Applicants traverse this rejection ground and submit that the vent hole 15 and the vent plug 17 constitute an "**ingress aperture means**," (see for example column 4, lines 35-36), rather than egress vent holes as recited in the present claim 1 on file.

6. Jensen, Carter, and Rottenberg cannot be properly combined

Applicants agree with the Examiner that "Jensen as modified by Carter does not disclose the vent plug is unplugged from the projectile body upon function of the fuse." Applicants further refer to the presentation they made earlier stating that Jensen and Carter cannot be justifiably combined to form an obviousness rejection ground.

Applicants traverse this rejection ground, and state that Jensen, Carter, and Rottenberg et al. cannot be properly combined, as submitted by the Examiner, in that neither reference discloses a motivation for such combination. As clearly explained by the legal authorities above, the **court requires that the examiner show a motivation to combine the references** that create the case of obviousness. In other words, **the examiner must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select

the elements from the cited prior art references for combination in th manner claimed."

Applicants submit that the office action does not provide such justifiable reasons. A wish or a desire "to allow for the proper venting of the gases within the projectile so that the pressure inside the projectile does not get too high thereby causing the projectile to explode and cause possible injuries." Applicants first submit that none of the three references supports such combination in that neither provides an explanation or motivation for such combination. Refer to the legal authorities above. In addition, the justification for such combination is not adequate in that the present invention does not address the problem of causing injuries, but rather to provide smoke signature.

7. Conclusion

Claim 1 as amended is not obvious in view of the cited references, whether considered individually or in combination with each other. Claim 1 is thus allowable, and such allowance is respectfully solicited.

8. Dependent claims

The remaining claims are similarly allowable for depending on claim 1. Such allowance is also respectfully requested.